A New Peptide Skin-Brightening Facial Cream Demonstrated Clinical Improvement in Jawline Sagging, Discoloration and Overall Photodamage

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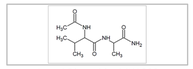
Introduction

Background

- Chronological aging and photoaging leads to skin discoloration, age spots, and more critically, sagging and loss of elasticity on facial skin.
- A microdipeptide technology (acetyl dipeptide, ADP) was developed to address these skin aging concerns.
  - Proven multifunctional benefits on the skin surface with microdipeptide size to facilitate penetration.



Acetyl Dipeptide, MW 229

Objective

- This clinical study was designed to test the effectiveness of a facial cream with a unique blend of acetyl dipeptide technology along with brightening and firming ingredients to reduce the key signs of facial aging.

Pre-Clinical Data on Acetyl Dipeptide

Gene expression profiling on living skin equivalent (LSE)

- Whole transcriptome analysis and Gene Ontology (GO) was performed on RNAs extracted from LSE treated with acetyl dipeptide for 48 hours.
- Acetyl dipeptide exhibited significant induction of genes related to barrier, hydration, plumping, epidermal metabolism, and senescence downregulation/inhibition (Ref 1).

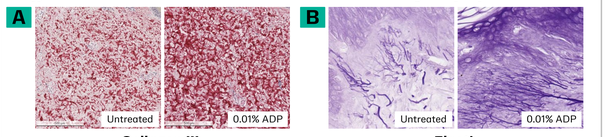
In vitro cell culture evaluation of acetyl dipeptide

- In human epidermal keratinocytes culture, acetyl dipeptide significantly inhibited inflammation markers IL-8 and TNF-α, $p<0.05$ vs. vehicle.
- In human fibroblast culture, acetyl dipeptide significantly increased the expression of five skin matrix components, including elastin, pro-collagen, hyaluronic acid, decorin, and fibronectin, $p<0.05$. (Ref 2).

Ex vivo evaluation of biomarker induction by acetyl dipeptide

- Human skin explant models were cultured and treated topically with acetyl dipeptide every 48 hours for up to 8 days before dissection and paraffin fixation.
- Fixed biopsy samples were probed with monoclonal antibodies against Collagen III and Elastin, which showed increases in staining by image analysis, indicating an increased synthesis of these markers (Figure 1).

Figure 1. Pre-clinical assessments of acetyl dipeptide



Clinical Study

Clinical Study Methodology

- Design: 16-week, single-center, institutional review board-approved, prospective clinical study with direct comparison to baseline condition.
- Subjects: Healthy females, ages 40-70 years, Fitzpatrick Skin Types I-VI.
- Key inclusion criteria: Having mild to moderate jawline sagging with fine lines and/or hyperpigmentation by expert visual grading (3 to 6 on a 0 to 9 scale).
- Test product: The face cream contained acetyl dipeptide, alpha hydroxy acid/polyhydroxy acid blend, acetyl tyrosinamide, and alpine plant extracts. The cream was applied twice daily to the face including under the jawline. A bland moisturizer SPF35 was provided for day use over the face cream.

Evaluations

- Clinical Measures: Baseline, Weeks 8, 12, and 16
  - Expert clinical grading using modified Griffith's scale (0-9 scale with half-point increments) for:
    - Sagging, laxity, and lift
    - Fine lines and wrinkles
    - Discoloration/hyperpigmentation
    - Skin tone evenness and overall photodamage
  - Tolerability by expert grading and subject query:
    - Objective: dryness, erythema, edema using a 0-4 scale
    - Subjective: stinging, burning, itching, tingling using a 0-3 scale
- Self-Assessment questionnaires: at Immediately after 1st application, after 1 day, Weeks 1 (at home), 8, 12, and 16 using a 5 point scale
- Digital photography: Baseline, Weeks 12 and 16
- Statistical analysis: Clinical grading scores were compared to baseline scores for each subject at each visit using a Wilcoxon signed-rank test for $p<0.05$ significance. Percent of change from baseline calculated from mean delta scores are presented. Self-assessment scores were tabulated.

Results

- **Subject Demographics**
  - 43 subjects completed the 16-week study (45 enrolled) as shown in the tables below:

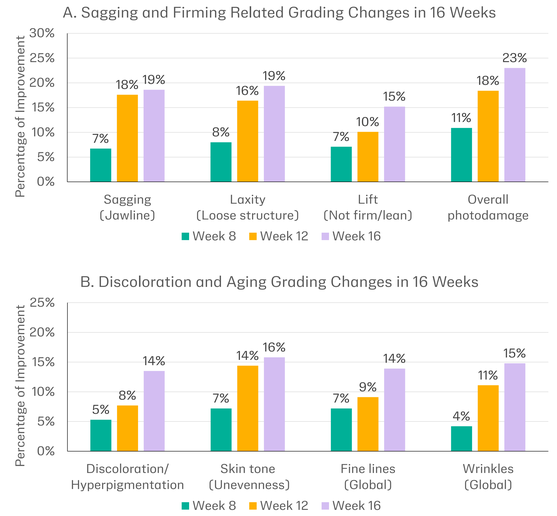
Race-Ethnicity	# of Subjects (%)
Black	7 (16.3)
Caucasian	29 (67.4)
Hispanic	6 (14.0)
Asian	1 (2.3)

Fitzpatrick Skin Types	# of Subjects (%)
I	2 (4.7)
II	20 (46.5)
III	10 (23.3)
IV	5 (11.6)
V	5 (11.6)
VI	1 (2.3)

- **Tolerability**
  - Tolerability assessment indicated that the test product was well tolerated and there were no adverse events reported.

- **Expert Grading**
  - Visual grading exhibited statistically significant improvement in all targeted signs of aging starting at week 8 and continuing through week 16 on all parameters (Figure 2).

Figure 2. Expert Grading of Clinical Improvement on Face



All grading changes are statistically significant to baseline, $p < 0.05$, N = 43.

- **Self-Assessment**
  - Subjects reported improvement over 16 weeks of test product use as summarized in Table 1.
  - In addition, over 70% of subjects noticed the appearance of their skin looks up to 5 years younger.

Table 1. Self-assessed improvement at Week 16

Consumer Perceptions on Sagging and Firmness	Percentage of Improvement*
Tighter/tauter jawlines	88%
Increased firmness	93%
Increased skin elasticity	93%
Refined facial contour	88%
Less sagging appearance	95%
More lifted appearance	91%
Volumized appearance	98%

Perceptions of Color and Other Aging Signs	Percentage of Improvement*
Brighter skin	95%
Increased radiance	93%
Less discoloration	86%
Fading dark spots	77%
Reduced fine lines/wrinkles	93%
Skin looks younger	95%
Less noticeable aging signs	95%

* Percentage of subjects noticing an improvement.

Clinical Photography

- Visible benefits to jawline contour and lift as well as overall skin discoloration and youthfulness further support the clinical grading (Figure 3).

Figure 3. Visible Improvement

Improved jawline contour (A, B), pigmentation (B, C), and overall signs of aging (C).

Conclusions

- New and prior pre-clinical data suggest that acetyl dipeptide inhibits inflammatory cytokines, strengthens skin's barrier and boosts the support matrix through both gene and protein expression (e.g., procollagen III and elastin).
- The facial cream with acetyl dipeptide, firming, and brightening ingredients was well-tolerated and provides clinical and consumer-perceived benefits to jawline sagging, facial skin firmness, skin brightening, and overall signs of aging.

Disclosures

This work was sponsored by Johnson & Johnson Consumer Inc.

References

1. Byren D, et al. American Academy of Dermatology Annual Meeting, Denver, CO, 20-24 March 2020.
2. Dufort M, et al. World Congress of Dermatology, Milan, Italy, June 10-15, 2019.

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